



Health, Well-Being and Open Space

Literature Review

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1 Introduction

Hunt *et al* (2000) state that the impact of the environment on health is complex and difficult to disentangle; health within an environmental context must be considered as a multifaceted and holistic phenomenon. They recognise that the identification of a link between environment and public health is not new and that environmental legislation targeted at protecting health through improved housing and sanitation go back centuries (*ibid.*; see also Morris, 2003; Gesler, 1998). However, Hunt *et al* (2000) note that by the mid-twentieth century the concerns of the 'sanitarian' public health movement began to diminish as environmental conditions improved and medical interventions became more effective (*ibid.*). Ulrich and Parsons (1992) believe that the villa gardens of the ancient Egyptian nobility and the Persian walled gardens of Mesopotamia indicate the great lengths to which the earliest urban peoples attempted to maintain direct contact with nature. In the 1860s/1870s US landscape architect, Frederick Law Olmsted was convinced that visual contact with nature was beneficial to the emotional and physiological health of city dwellers (*ibid.*). Olmsted's theories regarding the healthful, restorative effects

of nature in the urban environment were a major influence on the City Beautiful movement and had a widespread effect on the design of parks and urban landscaping (*ibid.*).

Gullone (2000) states that certain landscape features that we find aesthetically pleasing today may have an affinity with those that enhanced the survival of the species - for example, bodies of water, plants and animals, higher areas, trees with low trunks, trees with high canopies (Kahn, 1997; Wilson, 1984). Research seeking to identify humans' positive relationships with nature has gradually expanded over the last 20 years, particularly in the area of aesthetic preferences for varying landscapes (Gullone, 2000: 300). For example, Ulrich (1993) believes that certain advantages afforded by specific natural settings during our evolutionary history may have been so central to survival that natural selection favoured those individuals who acquired and retained certain positive or approach responses toward them.

Hazardous environmental exposure

Environmental health literature has traditionally focused on the hazardous nature of environmental exposures (Frumkin, 2001). There is a wealth of research that details the vast number of ways in which exposure to the natural environment can have a negative effect on human health (Cox, 2002; Boulware, 2003; Lundberg, 1998a). For example, (i) allergies such as asthma and hay fever, (ii) poisoning from sap, berries, fruits, and pathogenic fungi such as *Cryptococcus Neoformans* and *Blastomyces Dermatitidis*, and (iii) occupational health issues such as Lyme disease in forest and archaeological workers, vibration white finger in chainsaw workers, respiratory disease and pesticide exposure (Cox, 2002). When hazards to health in the physical environment interact with individual risk factors they can contribute to cancer, cardiovascular diseases, respiratory disorders allergies, neurological and motor disorders and accidental injuries. These risks are likely to be even more serious for older people than for the rest of the population (Ginn *et al*, 1997).

The *Public Attitudes to Quality of Life and to the Environment Survey* (2001) showed that public concern was greater in terms of pollution issues such as the disposal of hazardous waste, traffic exhaust fumes and urban smog, than local environmental issues (DEFRA, 2002). Air pollution has long been accepted as a cause of ill health although contemporary air pollution episodes are rarely as dramatic as the London smogs in the 1950s/60s (Hunt *et al*, 2000; DETR, c.2000; see also Lundberg, 1998b). The main

contemporary sources of most air pollutants still arise from fossil-fuel combustion (DEFRA, 2002). DEFRA (2002) and Hunt *et al* (2000) both state that the adverse health effects of exposure to high concentrations of chemicals such as benzene, 1.3-butadiene, carbon monoxide, lead, nitrogen oxides, ozone, particles and sulphur dioxide, range from mental impairment to cancer and, with excessive exposure, death. Whilst air quality has improved in urban and rural areas during the last 20 years, between 12,3000 and 24,100 deaths are thought to be hastened annually due to air pollution by ozone, particulates and sulphur dioxide (*ibid.*: 3; DEFRA, 2003: 76). Poorer people living in disadvantaged areas are exposed to the highest levels of air pollution (DEFRA, 2003).

Beneficial environmental exposure

Despite the above, there "is a long tradition that healing powers may be found in the physical environment, whether that entails materials such as medicinal plants, the fresh air and pure water of the countryside, or magnificent scenery" (Gesler, 1992: 736). Growing contemporary evidence also supports the view that exposure (both passive and active), and access, to greenspaces can have a wide range of social, economic, environmental and health benefits (Cox, 2002; Lundberg, 1998b; Burns, 1998; Ulrich and Parsons, 1992; Freeman, 1984). This includes certain medicinal uses such as the formulation of herbal remedies and drugs (e.g. Quinine) from plant extracts, and the practice of bathing in and drinking spa water, through to planting schemes which take into account the mythical and folkloric powers bestowed on trees and other flora (Cox, 2002; Gesler, 1992). Natural open spaces and well-designed greenspaces provide a locus for recreation, social interaction and community action, are a source of employment and natural resources, and are highlighted as having a particularly positive influence on health and well-being (MacArthur, 2002; Gruber, 1986; Steptoe and Butler, 1996; Gordon and Grant, 1997; Calfas and Taylor, 1994; Ulrich and Parsons, 1992).

This review has covered as diverse a literature as possible, ranging from promotional leaflets to academic papers, and deriving from international, English-language and European sources. In the review the terms 'countryside' and 'greenspace' are deemed to include urban fringe woodlands, inland waterways and urban parks. Techniques used to uncover literature for the review included a wide-ranging, key-word search of library catalogues, including universities, the National Library of Scotland and the British Library, and databases including the NISS (National Information Services System) Information Gateway, COPAC (Co-operative Academic Information Retrieval Network for Scotland),

SALSER (Scottish Academic Library Serials), the Index to Theses, IBSS ONLINE (BIDS), the Social Sciences Citation Index, the Arts and Humanities Citation Index and the Guardian and Observer Electronic Database. An international internet search was also undertaken using the same search terms.

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2 Open-air recreation

Open-air recreation and access to outdoor spaces is an important part of many people's daily lives, and research has shown that outdoor activity provides scope for relaxation, refreshment, escape from the everyday and a chance to form social relationships (Macnaghten and Urry, 2000). DEFRA (2002: 10) state that around 80% of the respondents to the survey of *Public Attitudes to Quality of Life and to the Environment* (2001) said that they had visited the countryside for pleasure in the previous 12 months. Yet, the Countryside Agency states that 7 out of 10 people do not take enough exercise (outdoors or otherwise) to benefit their health (The Countryside Agency, 2001; NUFU, 2002a; Department of Health, 2000). Many individuals believe that exercise *can* benefit their health but few put this into practice (Hardman and Hudson, 1989).

It is estimated that two-thirds of the Scottish adult population is now at risk from physical inactivity, making it the most common risk factor for coronary heart disease (CHD), one of the three biggest killers - alongside stroke and cancer - in Scotland today (Physical Activity Task Force, 2002; Cox, 2002; Central Scotland Countryside Trust, 2001). This is a trend that starts at school. Although physical activity data illustrates positive changes in the proportion of young people that are active, a Health Education Board for Scotland (HEBS, 2001a) survey showed that only 4 in 10 young people were physically active - in and/or out of school - for 6 hours a week or more. The HEBS survey also highlighted that participation in physical activity was differential according to gender; a significantly higher proportion of boys than girls reported exercising in their free time 4 or more times a week and for 4 or more hours a week (*ibid.*; see also Jean Alcock Research and Consultancy Services, 2001; Wold and Hendry, 1987; Biddle *et al*, 1998; Boreham *et al*, 1997; Craig *et al*, 1996; Bar-Or, 1994).

In their report *Let's Make Scotland Active*, the Physical Activity Task Force (PATF) (2002) discovered that class had a significant bearing on the extent to which an individual participated in physically active recreation. The report states that the proportion of

sedentary adults in the lowest socio-economic groups is double that among those from the highest socio-economic groups (PATF, 2002). However, the PATF recognise that it is too simplistic to consider this issue merely in terms of class; people from the lowest socio-economic groups are also among the most active - largely accounted for by more manual work and lack of access to private motorised transport (*ibid.*). Research suggests that increased health-related physical activity may also be of significance to minority ethnic groups. Cooper *et al* (2000) report that ill-health was substantially higher among older minority ethnic adults than older white adults, particularly for Bangladeshis.

The potential for improving CHD risk by improving the exercise habits of the population is considerable (Hardman and Hudson, 1989). Exercise has been identified as a key target area for action, primarily because of its role in the prevention of CHD, stroke and vascular disease. However, it also plays a part in modifying some of the risk factors for diseases such as obesity, hypertension and raised blood cholesterol (HEBS, 2001b; Department of Health, 2000; Physical Activity Task Force, 2002; Cooper *et al*, 1999). According to HEBS regular exercise;

"appears to provide some protection against other chronic diseases, such as osteoporosis (weight-bearing exercise), non-insulin dependent diabetes mellitus and depression. It makes important contributions to weight control and, among older people, to the maintenance of functional capabilities and the prevention of falls. In terms of mental health, exercise relieves anxiety and depression, contributes to improved self-confidence, self-concept and self-esteem and, more generally, enhances well-being" (HEBS, 2001b: 1).

In 1989 Hardman and Hudson stated that there was continuing uncertainty regarding the amount and kind of exercise needed to confer health benefits. Contemporary research generally agrees that physical activity does not need to be strenuous to have a significant effect on people's health, general well-being and productivity (PATF, 2002). Changes in 'metabolic fitness' can be detected following a relatively short intervention period (Buchanan *et al*, 2000). Improvements to people's health can be achieved by regular physical activity; the recommended target is 30 minutes of moderate exercise every day (Scottish Natural Heritage, 2002; NUFU, 2002a; PATF, 2002; Department of Health, 2000). Children and younger people are recommended to undertake some form physical activity for 1 hour a day at least 5 times a week and it is stressed that this time must be 'quality time' (PATF, 2002; Department of Health, 2000). It is generally agreed that, for the

majority, for exercise to have long-term benefits, it must be sufficiently intensive and easy to do.

HEBS stress that physical activity must be promoted as a necessary part of everyday life (HEBS, 2001b). This promotion should involve supporting the acquisition and use of skills necessary to maintain a physically active life, encouraging the development of safe environments for active living, and action to stimulate policies which promote physical activity as part of everyday life (*ibid.*).

Earlier research by HEBS (1997 cited in Physical Activity Task Force, 2002) suggested that 8 key barriers prevent or inhibit recreational and health based activity in public open spaces. These include being over-weight, not enjoying exercise, being too old, a lack of time due to other commitments, ill-health, injury or disability, a lack of suitable facilities, skills, confidence, money, and transport, fears over safety, and concerns about the environment or unpredictable weather conditions.

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3 The economic benefits of natural open space and greenspace

The National Urban Forestry Unit (undated) states that trees and greenspaces can aid economic regeneration in a number of ways. Not only do natural environmental features create more amenable and pleasant living spaces, they can also make areas more attractive to new employers who in turn create new employment opportunities. In Europe more than two-thirds of the population resides in urban areas and the quality of the urban environment, including green areas, is central to the ecological, economic and social reconstruction and development of European cities (Nilsson, 2002; PATF, 2002). The opportunities for open-air recreation and exercise afforded by greenspaces are important to local economies in terms of the provision of necessary recreational equipment, travel, accommodation, and gifts (Scottish Natural Heritage, 2002). Nearby greenspace has been shown to enrich real estate prices and attract economic activity, as well as having manifold socio-cultural functions (Tyrväinen, 1999; Patel, 1992; Kaplan, 1992a). For example, features such as well-groomed grounds, public access to 'corporate' gardens in plazas, parks, and roof tops, can greatly enhance corporate image (Parker, 1992), whilst the presence of plantscapes in and around the office environment has a significant impact upon worker satisfaction which in turn affects productivity (Randall *et al*, 1992; Parker, 1992).

Access to greenspace may also have important consequences for health and well-being of urban populations. For example, in a recent report *Securing our Future Health*, David Wanless looked at the long term trends affecting the health service and the implications for funding the NHS. He specifically drew attention to the importance of public health intervention and dealing with the primary determinants of health (MacArthur, 2002). The Institute of Leisure and Amenity Management (ILAM) has urged the Treasury and the Department of Health to accept the 'whole systems' approach to health care advocated by Wanless's report and to recognise the role of leisure in delivering the benefits of healthy lifestyles. They welcomed the recognition within the report that increased physical activity could have a major impact on the long-term costs of health provision.

Studies in Canada, Australia, the United States and Northern Ireland have tried to estimate the monetary value of potential savings to the national economy if physical activity is reduced and the PATF has conducted a similar study focusing on Scottish data for coronary heart disease, colon cancer and stroke (PATF, 2002). With a proposed goal of reducing the level of inactive Scots by 1% each year for the next 5 years, the economic benefits associated with the number of life years saved due to preventing these deaths was estimated to be £85.2 million (PATF, 2002). Ian MacArthur, chief executive of the United Kingdom Public Health Association, has commented that 'by dealing with the issues that prevent people from becoming ill, £30 billion a year could be shaved off the NHS budget by 2030' (Spear, 2002:1). There would also be reduced medical costs from treating other conditions such as depression, fractures due to falling, hypertension and diabetes.

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4 The environmental benefits of natural open space and greenspace

The Central Scotland Forest Forum (2003), Bains (2002) and the National Urban Forestry Unit (undated) all claim that taking a strategic approach to the planning and management of urban greenspace brings a wide range of environmental benefits. These include the filtering of air pollution (including soot and poisonous chemicals), the stabilisation of ground surfaces, the interception of rainfall which reduces flooding, the creation of visual and sound barriers, the provision of temporary cover for derelict sites, and encouraging the sustainability of wildlife habitats. Urban greenspaces also play a vital role in urban biodiversity, and contribute to sheltering, shading and water protection, and decreased local

air temperatures (Tyrväinen, 1999; MacArthur, 2002). Benefits for urban dwellers include the creation of a safe haven from city life, cultivation of an increased sense of pride in and stewardship of the local environment, and create a greater awareness and understanding of the needs of the countryside and of land management (Ulrich, 1984; Grahn, 1989; Kaplan and Kaplan, 1989; Scottish Natural Heritage, 2002). As will be demonstrated below, all of these environmental benefits also have direct and positive implications for public health and well-being. Yet for a number of reasons - the high level of urban pressures, lack of integrated planning and management, and limited specific knowledge of urban forests and trees - the full potential of urban greenspace is often not met (*ibid.*).

The National Urban Forestry Unit (NUFU) states that the;

'[g]reen spaces near where people live are an underused asset. They are often poorly maintained, disconnected, difficult to reach and perceived as unsafe. As a result, millions of people are unwilling or unable to walk in the green spaces on their doorstep' (2002a:1).

The United Kingdom is still burdened by gross inequalities in health that are often matched by inequalities in the quality of the environments in which we live. MacArthur (2002) believes that environmental regeneration and the creation of quality, aesthetically pleasing places for our communities to live, work and play is a key way in which to break the 'spiral of despair'. Woodland areas such as the Central Scotland Forest can make a big contribution towards a healthier society by (i) providing new opportunities for health enhancing physical activity, (ii) creating green and wooded places to enjoy, share with friends or relax, by (iii) growing trees which in turn filter and refresh the air people breathe, and maybe most importantly in view of the health concerns outlined above (iv) by providing a space for physical activity (Central Scotland Countryside Trust, 2001).

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5 The health benefits of natural open space and greenspace

There is a wealth of literature on the impacts of rural and urban environments on the physical, mental and spiritual health of local populations (Wilson, 1984; Freeman, 1984; Olds, 1989; Relf, 1992; Ulrich and Parsons, 1992; Chivan *et al*, 1993; Sooman and Macintyre, 1995; Lundberg, 1998; Honari and Boleyn 1999, Pacione, 2003). Urban greenspaces are now widely recognised as major contributors both to the quality of the environment, and to human health and well-being in inner city and suburban areas (Ulrich,

1984; Grahn, 1989; Kaplan and Kaplan, 1989). Although significant work has been undertaken in other disciplines, perhaps the most intensive research into the healing or restorative properties of the natural environment has been in the field of environmental psychology. These 'restoration perspectives' have been dominated by Kaplan and Kaplan's (1989) attention restoration theory and Ulrich's (1983) psychophysiological stress reduction framework (Korpela and Hartig, 1996; Kaplan, 1973; Kaplan and Kaplan, 1987; Hartig *et al*, 1991).

Ulrich (1979, 1981, 1984, 1991b, 2002) uses a range of empirical evidence to argue that the benefits of *viewing* greenspace or other nature goes beyond aesthetic enjoyment to include enhanced emotional well-being, reduced stress and, in certain situations, improved health (Moore, 1981; Verderber, 1986; Parsons, 1991; Ulrich *et al*, 1991; Ulrich and Parson, 1992; McAndrew, 1993 Heerwagen, 1998; on the viability of photographs as environmental stimulus see Vining and Orlando, 1989; Anderson *et al*, 1983; Ulrich *et al*, 1991; Ulrich, 1992; Honeyman, 1992; Hetherington *et al*, 1993). A much debated paper by Ulrich (1984) compared the medical records of gall bladder surgery patients who had window views of either trees or a brick wall. The results showed that patients with a view of trees had shorter post-operative stays, required fewer potent pain drugs, and received fewer negative staff evaluations than those with the wall view (Ulrich and Parsons, 1992; White and Heerwagen, 1998). Studies by Moore (1981) and West (1986) support Ulrich's claims; both reported that prison inmates used health-care facilities significantly less often if the view from their cells was toward natural areas (Kaplan, 1992a).

Other studies have also shown the restorative benefits of visual contact with vegetation and other nature. Keep *et al* (1980) and Ruys (1970) both offer evidence to show that windowless rooms in workplaces and health-care settings are disliked by users and can be stressful. There is also evidence to show that images of nature can have an impact on ultra-stressful interior environments such as those endured by astronauts and cosmonauts (Ulrich and Parsons, 1992; Wise and Rosenburg, 1988; White and Heerwagen, 1998).

In addition to the psychological manifestations of viewing nature, research has also been conducted on the physiological dimensions of stress and restoration (Ulrich and Parsons, 1992; Ulrich *et al*, 1991). One such study used physiological measures to investigate the stress-reducing effects of nature scenes in a health-care setting. The study involved a waiting room view being alternated between a large mural depicting a view of distant

mountains, clustered trees, and open grassy areas, and a blank wall (Heerwagen, 1990). Both heart-rate measurements and patient self-ratings confirmed that patients felt calmer or less stressed on the mural days (*ibid.*; White and Heerwagen, 1998).

Whilst detailed computer simulations can provide valid outcomes regarding environmental perception, Bishop and Rohrman (2003) point out that in certain respects they do not generate the same responses as the corresponding real environments. Whilst Kaplan (1992a) suggests that specific plants are not the major focus of the way people experience the environment, the presence of vegetation and the context created by it is. Bishop and Rohrman (2003) question the extent to which realism is needed and surmise that particular environmental features such as vegetation and colour need specific attention. They highlight that future research might well consider the interaction between appraisal of the environment itself and its depiction, and the psychological reasons for day/night differences.

Kaplan and Kaplan (1989) stretch beyond the work of Ulrich *et al*, to focus on what nature does, for whom, under what circumstances. They show that vegetation and nature reinforce our spontaneous attention, allow our sensory apparatus to relax, and infuse us with fresh energy (Nilsson, 2002; Kaplan, 1992b). The Kaplan's (1989) book *The Experience of Nature* concerns the natural environment, people, and the relationship between the two, and develops the concept of a restorative environment - an environment in which the recovery of mental energies and effectiveness is enhanced. They believe that the natural environment has a special relationship to each of the four factors that are important to a restorative experience (namely 'being away', 'extent', 'fascination' and 'compatibility') (Hartig *et al*, 1991; Kaplan, 1992b). For example, for an environment to be restorative one must feel a sense of distance, of 'being away' and a feeling of escape from some aspects of life that are ordinarily present - distractions, obligations, pursuits, purposes and thoughts (see Hammitt, 2000). Several other factors are also important: scope and connectedness - an environment that is extensive in time and space must also be sufficiently connected to construct a larger whole; fascination - essential in distinguishing between directed (voluntary) attention and involuntary attention, for example, nature is assumed to act on the involuntary attention whilst the directed attention (which can be depleted) recovers, and; compatibility - the fit between environment, the individual's inclination and actions required by the environment (Kaplan, 1983).

Kaplan and Kaplan (1989) are careful to point out, however, that far away nature or a vast wilderness is not the only setting for experiencing restorative experiences. The smallness of nearby nature need not be detrimental as proximity is often crucial. For example, the distinctiveness and separateness of the natural environment from the everyday may be as important as the literal distance. The failure to recognise the satisfactions and benefits of nearby natural settings - such as when landscaping is seen as an optional 'amenity' - has important consequences (Kaplan, 1992a). One factor that accounts for differences in environmental preference is familiarity, for example, direct experience and knowledge of a place will affect preference. Questions about place identity and restorative environments are receiving more attention from researchers in the environment-behaviour-design field, however, work in this area has for the most part proceeded independently (Korpela and Hartig, 1996). Korpela (1991) has suggested that restorative experiences figure in emotional- and self-regulation processes through which individuals develop place identity. He found that his subjects often went to their favourite places to relax, to calm down, and to clear their minds after threatening or emotionally negative events (Korpela, 1989, 1995; Korpela and Hartig, 1996).

Korpela and Hartig (*ibid.*) extend these preliminary observations to consider how individuals evaluate their favourite place using terms set out in restorative environments theory (see also Hartig *et al*, 1991). The environmental self-regulation hypothesis of Korpela (1989, 1995) provides a bridge between restorative environments and research on place identity. Favourite places identified by subjects were, in keeping with the literature on restorative environments, most often places with greenery, water, and scenic quality.

The relationship between humans and the natural environment spans a wide range of concerns, from the pragmatic to the spiritual. A review by McAuley (1994) identified improvement in overall feelings of self-worth and self-confidence, and improved self-concept in terms of physical attractiveness. A later study by Berger (1996) suggested that physical activity is associated with improvements in four broad areas: enhanced mood, stress reduction, a more positive self-concept, and a higher quality of life (Hickmann *et al*, 1999). Kaplan and Kaplan (1989) state that at present, the benefits and pleasures of nature are valued highly on a personal level but these rewards have little influence in the policy area. This is a view shared by many other theorists, and is attributed to a number of reasons including hesitancy to exert control over private property for the public good, and the scarcity of evidence or documentation to show the importance of natural settings

(*ibid.*). Participatory local schemes can be powerful forces in protecting valuable restorative environments. When valued simply as an amenity, nature can be easily replaced by greater technological achievement; when viewed as an essential bond between humans and other living things, the natural environment has no substitutes (*ibid.*:204).

Attempts to measure the benefits of exposure to the natural environment have been widespread. For example, when Bennett *et al* (1995) attempted to evaluate public access to a woodland site in monetary terms, they found that recreational benefits far outweighed the cost of access provision. The attributes that people valued most were 'peace and quiet', 'fresh air' and the 'landscape'. In terms of path quality, most people chose 'fresh air', followed closely by 'accessibility', 'car parking' and 'peace and quiet' (*ibid.*).

Other researchers have attempted to build more directly upon the work of Kaplan and Kaplan by finding ways in which to measure restorativeness. Laumann *et al*, (2001) set out to develop a set of rating scale measures of the restorative components of environments. In this study a group of people were first asked to imagine themselves to be in either a familiar nature environment or city environment which they then rated on unipolar scales intended to describe how they experienced the environments. They then viewed videos of a forest, park, sea area, city and snowy mountain and again rated them on unipolar scales intended to describe how they experienced the environments (Laumann *et al*, 2001). As the authors predicted, following Kaplan and Kaplan (1989), the environments with natural elements generally scored higher than city environments on all measures. They suggest that future research to determine whether fascination differs between natural and city environments would be valuable. However, they acknowledge the fascination in the urban environment may be relative to activities rather than to the environment *per se* (Laumann *et al*, 2001). A more recent study by Han (2003) highlights that although restorative reactions do occur in bodily systems, restoration is often triggered by surrounding settings.

The literature suggests that there are 5 key ways in which exposure to the natural environment is beneficial to human health. These are:

- [Enhanced personal and social communication skills.](#)
- [Increased physical health.](#)

- [Enhanced mental and spiritual health.](#)
- [Enhanced spiritual, sensory, and aesthetic awareness.](#)
- [Ability to assert personal control and increased sensitivity to one's own well-being.](#)

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5.1 Enhanced personal and social communication skills.

The extent to which participation in activities within natural open spaces encourages individuals to build confidence and self-esteem, develop basic social skills, and maintain or improve their quality of life, and how this might be measured is a contested issue. Several authors point out that terms such as 'quality of life' are not well defined, and there is little information which outlines the ways in which health professionals understand the term (McKevitt *et al*, 2002; on the ambiguity of the term 'quality of life' see Smith, 2001). In McKevitt *et al*'s (2002) study of professionals working with stroke patients, it was found that professionals defined quality of life largely in terms of 'happiness'. This is a definition which contrasts with those used in the medical literature which emphasise physical and clinical domains and some specific arguments that health-related quality of life should not include more abstract concepts such as life satisfaction. The definition of quality of life as 'happiness' suggests that professionals hold at least two models of quality of life: the first as in a colloquial everyday sense, and the second, a 'scientific' quality of life, a measurable outcome to be used in research and a tool to rationalise the delivery of health care (McKevitt *et al*, 2002).

Outdoor recreation provides an opportunity to increase quality of life and heighten social interaction - for example, when meeting people or going out in small groups - and thus helps to enhance community spirit and foster a more socially inclusive society (Scottish Natural Heritage, 2002). Ryan (1997) describes the impact of incorporating therapeutic gardening into reminiscence work for people with dementia, regaining mobility, dexterity and co-ordination after a stroke, to regain confidence and self-esteem, and in the treatment of drug and alcohol problems (Mattson, 1992; Ryan, 1992). Interaction with plants and earth enables sensory stimulation, provides an opportunity to keep warm through activity, and exposes the body to fresh air. It can also help people gain basic and social skills, obtain qualifications, rebuild their lives, and maintain or improve quality of life. It provides something to talk about, a chance for enthusiasts to impart knowledge, it 'humanises' institutions, provides motivation, induces aesthetic satisfaction, status and self-esteem (Ryan, 1992; Browne, 1992; Mattson, 1992; see also Azar and Conroy, 1992).

[Index](#)**5.2 Increased physical health.**

In the last two centuries walking has shifted from being a 'central mode of transport' to 'leisure activity'. According to the Department of Transport, it is the most popular physical activity undertaken for pleasure and is widely advocated as a valuable form of aerobic exercise (HMSO, 1998). Walking and outdoor sports such as cycling are being increasingly recognised as one of the best ways to improve people's physical health and mental well-being (Countryside Agency, 2000; Davis, 1999; Browne, 1992; on the injury rates associated with walking, cycling and other outdoor pursuits such as gardening see Powell, 1998). Various bodies recommend brisk walking as a way of developing and maintaining cardio-respiratory fitness, body composition, muscular strength and endurance in adults (American College of Sports Medicine, 1998; NHS Scotland, 2001). Other benefits include a diminished risk of osteoporosis, falls and fractures and the maintenance of mobility (Cooper *et al*, 1999; on the risk of injury whilst walking see Powell *et al*, 1998; Ebrahim *et al*, 1997). Walking requires no special equipment, time-keeping (unless taking part in a group exercise), transport, money or arrangements with others, and provides an easy and convenient way to improve health (Cooper *et al*, 1999). However, Davis (1999: n.p.a.) highlights that unfortunately the average distance travelled per person per year for walking has reduced from 255 miles in 1976 - 1979 to 200 miles in 1994 - 1996; and for cycling the respective figures are 51 miles per person per year to 38 miles.

The 'Walking the Way to Health Initiative' (WHI) (launched 2000) is aimed at (but not exclusive to) people aged 45 and over, ethnic minority communities, those on low incomes and others whom have been identified as being at increased risk of ill health due to lack of exercise (NUFU, 2002a). The WHI has become a blueprint for successfully encouraging regular exercise and for increasing the popular use of public green space. It is now being replicated in a similar initiative - Paths to Health - in Scotland (NUFU, 2002a). Organised walking programmes are now being set up across the United Kingdom to encourage sedentary people to become physically active by walking in their local area in the company of other people (Health Walks Research and Development Unit, 2000). The scheme has attracted 700 people to walk since January 1998 and participants have listed physical fitness, the countryside and the social side of the walks as important motivating factors.

Walking is particularly effective for middle aged and older adults as the intensity of exercise required to produce health benefits is less than that needed to improve health in younger groups. For example, in a study into the effects of a walking exercise programme on the physical function and emotional state of elderly Korean women, Shin (1999) noted that maximal oxygen uptake and flexibility of the women progressively improved as the duration of the exercise period continued. Shin concluded that walking was a practical and easy method of exercise to enhance the health of older women. In tests carried out by Buchanan *et al* (2000), subjects walked significantly faster outdoors than on the treadmill. Participants felt that to encourage them to keep 'health walking', schemes must be varied and graded according to difficulty (Ashley *et al*, 2000). According to The Countryside Agency (2000), the three main areas that were necessary to ensure volunteers became involved and committed were companionship, ownership of the scheme and appreciation of their commitment by the scheme organisers.

The future of all health walks depends upon three key factors. First there must be loose central control which allows each scheme to develop its own identity and therefore retain ownership. Second, further research is needed to provide the evidence to answer the fundamental question - do health walks increase physical activity levels amongst those in most need and do they continue to sustain these levels (on the transport preferences of senior citizens see Schwanen *et al*, 2001)? Third, that Primary Care Groups (PCGs) recognise and endorse Health Walk schemes and recommend that GPs can safely refer patients onto the schemes (Health Walks Research and Development Unit, 2000). Walking appears to be at least as effective as other primary care based exercise schemes, but is likely to be cheaper as schemes are run predominantly by volunteers (Lad, 2000). Many businesses have also made the link between improved health and reduced stress levels on productivity and have initiated schemes to encourage staff to walk/cycle to work, using practical advice given in the HEBS 'Walk in to Work Out' pack (Mutri *et al*, 1999). HEBS has also been promoting walking through its 'Walk about a bit' campaign which is supported by the innovative 'Paths to Health' project, launched by the Paths for All Partnership in October 2001.

Psychological well-being does not necessarily have to be derived through physical activity. The aesthetics of natural and green landscapes can have an important impact upon mental health. As noted in Section 1.4 plants and aesthetically pleasing landscape design can help to create a more relaxing, home-like, and non-institutional setting for restoration

and recovery (Browne, 1992). Browne (1992) has shown that elderly residents in one retirement community preferred superior viewing positions and panoramic views with long vistas framed by plants, in an informal setting with water, grass and trees. The opportunity to observe nature, variety, colour and detail in vegetation were also key to the regenerative experience. Neatly trimmed plants that provided spatial order and legibility were also highly rated (*ibid.*). Browne (1992) notes that the often sedentary nature of retirees leads them to become accurate and acute observers of their environment and it is crucial to provide a variety of plants with seasonal variation. This important not only for aesthetic reasons but also because plants can provide an aide memoire to previous home environments, maintain mental activity and awareness of time, and decreases boredom.

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5.3 Enhanced mental and spiritual health.

Exercise is also associated with improvements in psychological and spiritual health (Hickmann *et al.*, 1999; Oxford Brookes University, 2001). Physical activity in the natural environment not only aids an increased life-span, greater well-being, fewer symptoms of depression, lower rates of smoking and substance misuse but also an increased ability to function better at work and home (Physical Activity Task Force, 2002; Oxford Brooks University, 2001; Skelton and Young, 1999; Mersey, 1991). Outdoor activity is widely thought to enable one to escape from the pressures of modern living, achieve an enhanced state of relaxation and refreshment, tackle new challenges, and help reduce anxiety and stress levels (Scottish National Heritage, 2002). Walking in the natural environment, in particular, is widely conceived to be a valuable and enjoyable antidote to the stresses, complication, regulation and non-reflexive nature of modern urban life, a time in which the body 'comes alive' (Edensor, 2000; Duerden, 1978; Wallace, 1993). Participants — in particular those with depression — in the Green Gym outdoor conservation project at Portslade near Brighton noted improved mental health and enhanced feelings of well-being as a result of taking part (Oxford Brookes University, 2001; BTCV, 2002). Whereas many people shy away from the traditional gym environment or drop out of exercise programmes after just a few weeks, the work, social aspects, and incentive to be out in the open air provided by the Green Gym scheme kept people motivated and increased adherence to the project (BTCV, 2002).

In 1999 *The Guardian* newspaper ran a story by Rouse entitled 'Prescribing the good life' to introduce the concept of 'Healthy Living Centres' such as the one at Bromley-By-Bow.

The centres aim to encourage GPs, therapists, health authorities and patients to think creatively about improving health and preventing illness rather than continuing to focus on single ailments (Rouse, 1999). Alongside arts activities and complementary therapies such as acupuncture, patients are also offered 'garden' prescriptions.

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5.4 Enhanced spiritual, sensory, and aesthetic awareness.

Outdoor recreation and, in particular, walking is a multi-sensual and stimulating experience which frees the mind and generates reflexivity, philosophical and intellectual thought, aesthetic contemplation and opens up a more 'natural' self (Edensor, 2000; Leed, 1991; Wallace, 1993; on the reflexive body and different types of walking see Kay and Moxham, 1996). For example, Oussett *et al* state; 'the wind rustling in the trees, the water running out of a pond, the smell of the damp soil, the heat of the sun warming the skin, face hands and arms, all this is an encouragement to natural relaxation and brings a feeling of physical and mental well-being' (1998: 372). When Health Walk and Green Gym participants were questioned as to their motivation, they stated that being 'in the countryside' and 'contact with nature' were their primary reasons to be active (Bird, 2002). Walking is a practice that can restore natural perception and reconnect human beings with the physical world of nature (Edensor, 2000; Duerden, 1978; Wallace, 1993). However, one must acknowledge that cultural meanings and social relations are not only inscribed upon the body, but are produced by it, and the senses both experience and structure space (Edensor, 2000). Edensor concludes that the body 'can never mechanically pass seamlessly through rural space informed by discursive norms and practical techniques. The interruptions of stomach cramps and hunger, headaches, blisters, ankle strains, limbs that 'go to sleep', muscle fatigue, mosquito bites and a host of other bodily sensations may foreground an overwhelming awareness of the body that dominates consciousness [...] The terrain and climate are apt to impose themselves upon the body, irrespective of discourses about the rural idyll and the Romantic countryside. The body must perform certain tasks, which may be painful or pleasurable in their novelty, or challenging in their awkwardness' (*ibid.*:101).

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5.5 Ability to assert personal control and increased sensitivity to one's own well-being.

In a paper which examines participation in physical activity during later life, Grant (2001) states that increasing numbers of older people are choosing to participate in a diverse range of leisure pursuits (see also Greenwald, 1997). As a result the stereotypical views and images associated with old age are gradually being challenged (Greenwald, 1997). Yet, despite agreeing that exercise is 'good for you', a high proportion of elderly people continue to 'allow physical activity to become a memory rather than a regular occurrence' (Grant, 2001:778; see also Dishman, 2001; Blair and Wei, 2000; O'Brien Cousins, 2000). The decline in physical activity with age is far more pronounced in women than men (Cooper *et al*, 1999). Grant highlights several barriers that inhibit older persons from participating in out-door physical activity. For some, changes in functional capacity often serve as a deterrent whilst for others the physical, social and psychological challenges created by the stigma associated with being older far outweigh the perceived benefits of physical activity (Grant, 2001; Cooper *et al*, 1999). For others a lack of childhood participation in sport or outdoor activity dissuades them from choosing such activities in later life, sometimes the feeling of physical and social vulnerability whilst undertaking physical exercise alone is a key prohibitive factor (O'Brien Cousins, 2000; Vertinsky, 1995). The fear of 'wearing out' or injury and negative perceptions of personal health and fitness, including beliefs about what the older body should and should not do (e.g. older people should rest and not take part in physical activity), also inhibits participation (Grant, 2001; Cooper, 1999; Fahey, 2002; Finch, 1997). Other barriers suggested by Cooper *et al* (1999) and Fahey (2002) include a perceived lack of suitable facilities and programmes for older people, a lack of transport or money, and a lack of time.

Grant (2001) highlights that there is overwhelming evidence to support the benefits of maintaining a physically active lifestyle, and that such behaviour can contribute significantly to quality of life and the 'feel better phenomenon' (see Mathieu, 1999; Ruchlin and Lachs, 1999; Spirduso, 1995; Chodzko-Zajko, 2000; Huber, 1997; Kilgman *et al*, 1999; O'Brien Cousins and Horne, 1999; Shepherd, 1997; Pollock-Squires, 1996; Brown, 1995). For Grant's (2001) study group, the first experiences of sport or other forms of physical activity had often been embarrassing and had required a certain degree of perseverance, although, in time, the health and social benefits derived from physical activity became a highly valued part of their existence. The results of this research signify that much is to be gained by regularly partaking in deliberate physical activity during later life. However, changes are required at a personal and societal level before a greater proportion of the older population become more physically active. Grant (*ibid.*) strongly

believes that studies of ageing often lose sight of the lived body (Featherstone and Wernick, 1995). For example, the study of ageing should consist not only of 'reports about so-called facts and scientific explanations about physiological and psychological processes, but also descriptions of the meaning people attribute to their experiences of physical activity' (Grant, 2001:781). Grant stresses the fact that physicality means different things to different people, and many of the benefits are subjective, intangible and impossible to quantify. As a consequence, he believes that the development of an alternative theoretical position would be desirable. However, to date, studies seeking alternative bodies of knowledge remain seriously under-represented in the field of gerontology.

Ulrich and Parsons (1992) note that a large body of research on recreational experiences has indicated that leisure activities in nature settings and vegetation are important for helping people cope with stress as well as in meeting other non-stress-related needs. Wilderness experiences and outward bound courses have long been promoted as effective forms of complementary therapy. For example, Jerstad and Stelzer (1973) examined the therapeutic value of adventure experiences as treatment for patients with mental illness, whilst Witman (1987), Marx (1988), Pearson (1989) and Warady (1994) have all looked at the role of outdoor adventure therapy and camping in the treatment of adolescents. More recently, Hyer *et al* (1996) have looked at the effects of outward bound experiences when used as a supplement to the PTSD treatment of war veterans. Research has also been undertaken on the use of adventure therapy and therapeutic camping for individuals who abuse alcohol and drugs (Kennedy, 1993; Bennett *et al*, 1998; see also Easley *et al*, 1990). In a study involving 91 adolescents admitted to the Beech Hill Hospital/Hurricane Island Outward Bound School Adolescent Treatment Program, Kennedy (1993) noted that 1 year post-treatment, 47% reported complete abstinence from alcohol and other drugs. A pilot study undertaken by Bennett *et al* (1998) found that a group of adults taking part in the Algonquin-Haymarket Relapse Prevention Program near Chicago, showed significant improvements in autonomic arousal, lowered frequency of negative thoughts, and alcohol craving. After 10 months the relapse rate for the experimental group was 31% and 58% for the comparison group (Bennett *et al*, 1998).

Wesley *et al* (2000) caution against the simplistic view that any activity may serve as a rehabilitative function, and warn that the nature and organisation of adventure activities are based on patriarchal models that valorise conquering obstacles and completing

challenging tasks. They argue that this can be particularly destructive and 're-victimising' when applied to female survivors of abuse.

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6 Making connections between people and the natural environment.

Natural open space and greenspaces have the potential to make a positive and wide-ranging contribution to the physical, mental and social aspects of people's health (Central Scotland Countryside Trust, 2001; Reilly, 2002). The potential scale of benefits will take time to be fully realised and will depend largely on policies and actions to encourage people to feel a sense of pride about green open spaces, to increase community interest in planning and developing new woodland sites and to foster greater use of new access opportunities (*ibid.*). Many people believe that the countryside, including the woodlands it contains, does enhance feelings of well-being. Many people associate the countryside with positive feelings of peace and quiet, relaxation, tranquillity and a sense of getting away from it all. Olds (1989:28) believes that 'contact with nature during childhood [is] critical both for internalising healing images, and for direct experience with energetic forces that affect physical and psychic well-being'.

In *Exploring Linkages Between the Environment and Health*, Henwood (2001) suggests ways in which environmental and countryside agencies might better promote the health benefits of the amenities they have to offer. For example, benefits can be contextualised within a broader health promotion agenda that takes into account perception of health as one among other personal and social goals (*ibid.*). Information regarding the health benefits of physical exercise in natural settings can be combined with messages about the appeal of other benefits and attractions such as aesthetic appeal of the scenery. Some recognition of the 'sensuous pleasures' and 'feelings of togetherness at sharing communal spaces, identities and values' can also be used to guide and enhance the effectiveness of open, natural spaces to promote health and well-being. Overall, there is a need for comparison with other countries, long-lasting structures and programmes of work; equal opportunities and access; working in partnership and sharing responsibilities; high quality development influenced by evidence where it exists and experimentation and research where it does not (Physical Activity Task Force, 2002). To achieve an integrated response, agencies and 'governments' at all levels need to work more closely together in partnership (MacArthur, 2002).

In the long-term a strategy is required which integrates land-use planning with economic regeneration, education, recreation land management, public safety, etc. In the short-term, the journey must begin by establishing a clearer link between accessible urban greenspace and healthy living, in the minds of politicians, policy-makers and the general public (Baines, 2002; see also Pretty *et al*, 2003). Local authorities need to develop strategies to increase walking such as pedestrian route networks, safer routes to school, walk for life initiatives, traffic calming, compact cities, making links with public transport and minimising the impact of the car (Sloman, 1997).

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7 Future research

Drawing upon the findings of the review it is possible to suggest several areas for development. The first concerns the ways in which research and development are conducted. For example, in a report on urban forestry Nilsson (2002) highlights one of the main concerns in the debate surrounding the health benefits, and use, of open space: relevant research activities are currently fragmented and mono-disciplinary. This would suggest a need for increased multi-disciplinary collaboration and effective partnership working between relevant agencies and governing bodies. In 1989 Kaplan and Kaplan highlighted that many of the themes they discuss have not been studied empirically and for most there is only a limited vocabulary. Future research might include empirical studies that evaluate the importance of natural settings to health and well-being and, for example, the role of green gyms, health walks and horticultural therapy. For example, Bird (2002) believes that there is an urgent need to look at the health benefits of green space and to study issues such as drop out rates from gyms compared to those using green open space.

Research is also needed into the creation of opportunities for people to enjoy natural open spaces close to where they live, particularly if they have restricted mobility. Bennet *et al* (1995) accept that access to the countryside for walking is of substantive value to the general public (Walker, 1994). Yet provision of access can incur significant costs in terms of path maintenance and site management, the bulk of which are borne by local authorities or other public bodies (Thomson and Whitby, 1976). The cost of provision of public access to paths in commercial forests is c. £27 per ha of woodland annually (Forestry Commission, 1992). These bodies require assurance that the costs they incur are outweighed by the benefits of access. The authors highlight the fact that countryside areas

rarely have a market price (i.e. in the form of entrance fees) and therefore quantification of their relative benefits is difficult. Such benefits have gone unvalued in any quantitative, monetary way. They conclude that 'contingent valuation is an appropriate and very useful technique for assessing countryside access and recreational benefits' (*ibid.*:416).

Health researchers must develop effective approaches for enhancing both physical and psychological wellbeing for individuals from many different backgrounds. There is a significant lack of research dealing in activity levels for people with disabilities, people from ethnic groups, people over seventy-four, children, and people with specific health conditions (Physical Activity Task Force, 2002; Hickmann *et al*, 1999). Further work is needed to evaluate the safest way of achieving increased activity levels in different groups, such as older women and those at risk of fractures. In addition, further efforts are required to increase the acceptability of and adherence to programmes of brisk walking and other physical activities among older women. This might include group walking programmes, defined walking routes, comparisons with other exercise such as strength training, psychological reinforcement (rewards) and more specific advice on how to avoid falls, how to walk carefully and choice of footwear (Ebrahim *et al*, 1997).

Key points from the review can be summarised as follows:

- Exposure to the natural environment can have a negative effect on human health.
- Exposure and access to greenspaces can also have a wide range of social, economic, environmental and health benefits.
- Trees and greenspaces can aid economic regeneration by making areas more attractive to new employers who in turn create new employment opportunities.
- Trees and greenspaces filter air pollution, stabilise ground surfaces, intercept rainfall, create visual and sound barriers, provide temporary cover for derelict sites, sustain wildlife habitats by enabling urban bio-diversity, contribute to sheltering, shading and water protection, and decreased local air temperatures.
- Urban greenspaces are major contributors to the quality of the environment and human health and well-being in inner city and suburban areas.
- Terms such as 'quality of life' are not well defined, and there is little information which outlines the ways in which health professionals understand the them.
- Outdoor recreation provides an opportunity to increase quality of life and heighten social interaction.

- Walking is increasingly recognised as one of the best ways to improve people's physical health and mental well-being.
- Physical activity in the natural environment not only aids an increased life-span, greater well-being, fewer symptoms of depression, lower rates of smoking and substance misuse but also an increased ability to function better at work and home.
- Health Walk and Green Gym participants cited they stated being 'in the countryside' and 'contact with nature' as key motivating factors to be active.
- Long-term strategies are required which integrate land-use planning with economic regeneration, education, recreation land management, public safety.
- Short-term strategies must begin by establishing a clearer link between accessible urban greenspace and healthy living in the minds of politicians, policy-makers and the general public.

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